(3) Whether the investigation can be carried out without incurring undue cost, schedule, or risk of failure penalties; and

(4) Whether integration of the instrument is feasible.

(g) In reviewing an investigator's management plan, the Project Office should evaluate the investigator's approach for efficiently managing the work, the recognition of essential management functions, and the effective overall integration of these functions. Evaluation of the proposals under final consideration should include, but not be limited to: workload—present and future related to capacity and capability; past experience; management approach and organization; e.g.:

(1) With respect to workload and its relationship to capacity and capability, it is important to ascertain the extent to which the investigator is capable of providing facilities and personnel skills necessary to perform the required effort on a timely basis. This review should reveal the need for additional facilities or people, and provide some indication of the Government support the investigator will require.

(2) A review should be made of the investigator, the investigator's institution, and any supporting contractor's performance on prior investigations. This should assist in arriving at an assessment of the investigator and the institution's ability to perform the effort within the proposed cost and time constraints.

(3) The proposed investigator's management arrangements should be reviewed, including make or buy choices, support of any co-investigator, and preselected subcontractors or other instrument fabricators to determine whether such arrangements are justified. The review should determine if the proposed management arrangements enhance the investigator's ability to devote more time to the proposed experiment objectives and still effectively employ the technical and administrative support required for a successful investigation. In making these evaluations, the Project Office should draw on the installation's engineering, business, legal, and other staff resources, as necessary, as well as its scientific resources. If further information is needed from the proposers, it should be obtained through the proper contacts.

### 1872.405 Program office evaluation.

(a) A Program Office responsible for the project or program at Headquarters will receive the evaluation of the proposals, and weigh the evaluative data to determine an optimum payload or program of investigation. This determination will involve recommendations concerning individual investigations; but, more importantly, should result in a payload or program which is judged to optimize total mission return within schedule, engineering, and budgetary constraints. The recommendations should facilitate sound selection decisions by the Program AA. Three sets of recommendations result from the Program Office evaluation:

(1) Optimum payload or program of investigations, or options for alternative payloads or programs.

(2) Recommendation for final or tentative selection based on a determination of the degree of uncertainty associated with individual investigations. A tentative selection may be considered step one of a two-step selection technique.

(3) Upon consideration of the guidelines contained in 1872.502(a)(3), recommending responsibility for instrument development.

(b) The Installation Project Office evaluation is principally concerned with ensuring that the proposed investigation can be managed, developed, integrated, and executed with an appropriate probability of technical success within the estimated probable cost. The Headquarters Program Director, drawing upon these inputs, should be mainly concerned with determining a payload or program from the point of view of programmatic goals and budgetary constraints. Discipline and cost trade-offs are considered at this level. The Headquarters Program Office should focus on the potential contribution to program objectives that can be achieved under alternative feasible payload integration options.

(c) It may be to NASA's advantage to consider certain investigations for tentative selection pending resolution of uncertainties in their development.

Tentative selections should be reconsidered after a period of time for final selection in a payload or program of investigations. This two-step selection process should be considered when:

(1) The potential return from the investigation is sufficient, relative to that of the other investigations under consideration, and that its further development appears to be warranted before final selection.

(2) The investigation potential is of such high priority to the program that the investigation should be developed for flight if at all possible.

(3) The investigative area is critical to the program and competitive approaches need to be developed further to allow selection of the optimum course.

(d) Based on evaluation of these considerations associated with the investigations requiring further development of hardware, the following information should be provided to the Steering Committee and the Program AA responsible for selection:

(1) The expected gain in potential return associated with the eventual incorporation of tentatively recommended investigations in the payload(s) or program.

(2) The expected costs required to develop instrumentation to the point of ''demonstrated capability.''

(3) The risk involved in added cost, probability of successfully developing the required instrument capability, and the possibility of schedule impact.

(4) Identification of opportunities, if any, for inclusion of such investigations in later missions.

(e) In those cases where investigations are tentatively selected, an explicit statement should be made of the process to be followed in determining the final payload or program of investigations and the proposers so informed. The two-phase selection approach provides the opportunity for additional assurance of development potential and probable cost prior to a final commitment to the investigation.

(f) As instruments used in investigations become increasingly complex and costly, the need for greater control of their development by the responsible Headquarters Program Office also grows. Accordingly, as an integral part of the evaluation process, a deliberate decision should be made regarding the role of the Principal Investigator with respect to the provision of the major hardware associated with that person's investigation. The guidelines for the hardware acquisition determination are discussed in 1872.502(a)(3).

(g) The range of options for responsibility for the instrumentation consists of:

(1) Assignment of full responsibility to the Principal Investigator. The responsibility includes all in-house or contracted activity to provide the instrumentation for integration.

(2) Retention of developmental responsibility by the Government with participation by the Principal Investigator in key events defined for the program. In all cases the right of the Principal Investigator to counsel and recommend is paramount. Such involvement of the Principal Investigator may include:

(i) Provision of instrument specifications.

(ii) Approval of specifications.

(iii) Independent monitorship of the development and advice to the Government on optimization of the instrumentation for the investigation.

(iv) Participation in design reviews and other appropriate reviews.

(v) Review and concurrence in changes resulting from design reviews.

(vi) Participation in configuration control board actions.

(vii) Advice in definition of test program.

(viii) Review and approval of test program and changes thereto.

(ix) Participation in conduct of the test program.

(x) Participation in calibration of instrument.

(xi) Participation in final inspection and acceptance of the instrument.

(xii) Participation in subsequent test and evaluation processes incident to integration and flight preparation.

(xiii) Participation in the development and support of the operations plan.

(xiv) Analysis and interpretation of data.

(h) The Principal Investigator should as a minimum:

(1) Approve the instrument specification.

(2) Advise the project manager in development and fabrication.

(3) Participate in final calibration.

(4) Develop and support the operations plan.

(5) Analyze and interpret the data.

(i) The Project Installation is responsible for implementing the program or project and should make recommendations concerning the role for the Principal Investigators. The Program AA will determine the role, acting upon the advice of the Headquarters Program Office and the Steering Committee. The Principal Investigator's desires will be respected in the negotiation of the person's role allowing an appeal to the Program AA and the right to withdraw from participation.

(j) The Program Office should make a presentation to the Steering Committee with supporting documentation on the decisions to be made by the responsible Program AA.

**1872.406 Steering committee review.**

(a) The most important role of the Steering Committee is to provide a substantive review of a potential payload or program of investigations and to recommend a selection to the Program AA. The Steering Committee applies the collective experience of representatives from the program and discipline communities and offers a forum for discussing the selection from those points of view. In addition to this mission-specific evaluation function, the Steering Committee provides guidance to subcommittee chairpersons and serves as a clearinghouse for problems and complaints regarding the process. The Steering Committee is responsible for assuring adherence to required procedures. Lastly, it is the forum where discipline objectives are weighed against program objectives and constraints.

(b) The Steering Committee represents the means for exercising three responsibilities in the process of selecting investigations to:

(1) Review compliance with procedures governing application of the AO process.

(2) Ensure that adequate documentation has been made of the steps in the evaluation process.

(3) Review the results of the evaluation by the subcommittee, Project, and Program Offices and prepare an assessment or endorsement of a recommended payload or program of investigations to the Program AA.

(c) The Purpose in exercising the first of the responsibilities in paragraph (b) of this section is to ensure equity and consistency in the application of the process. The Steering Committee is intended to provide the necessary reviews and coordination inherent in conventional acquisition practices.

(d) The second and third responsibilities of the Steering Committee in paragraph (b) are technical. They require that the Steering Committee review the evaluations by subcommittee, the Project Office, and the Program Office for completeness and appropriateness before forwarding to the Program AA. Most important in this review are:

(1) Degree to which results of evaluations and recommendations follow logically from the criteria in the AO.

(2) Consistency with objectives and policies generally beyond the scope of Project/Program Offices.

(3) Sufficiency of reasons stated for tentative recommendations of those investigations requiring further instrument research and development.

(4) Sufficiency of reasons stated for determining responsibilities for instrument development.

(5) Sufficiency of consideration of reusable space flight hardware and support equipment for the recommended investigations.

(6) Sufficiency of reasons for classifying proposed investigations in their respective categories.

(7) Fair treatment of all proposals.

(e) The Steering Committee makes recommendations to the selection official on the payload or program of investigations and notes caveats or provisions important for consideration of the selection official.

**1872.407 Principles to apply.**

(a) 1872.406 contains a description of the evaluation function appropriate for a major payload or very significant